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WE give in another column the report of the special commission of experts summoned to assist in the examination of the coroner's jury on the fall of the Rockford Court House, and the essential part of the coroner's verdict rendered thereupon. The main points of the examination recorded in the report have been anticipated, that the piers provided in the plans for the support of the iron columns were too small for security, but that if they had been exactly according to the plans and specifications they would probably not have given way as they did; that they were built smaller than the plans required (by more than a fourth, the report says), of inferior brick badly laid in inferior mortar; and that these facts might have been discovered and the ruin of the building averted by a careful inspection at any time before the superstructure was set on the columns. The contract to which the experts refer, that between the board of supervisors and the builder, assigned the control of the building and the appointment of the superintendent to the architect, while by it the contractor assumed all the risks of any kind incident to the work. About the contract or agreement between the board and the architect, whereby the oversight of the building was taken out of the hands of the architect, who was only to be called on for occasional consultation or explanation, while a superintendent, who was one of themselves, was appointed by the board,—about this the report says nothing, because the commission were not consulted about it; but it condemns the appointment of the superintendent as an example of bad practice. It declares finally that the architect failed to make sufficient calculation of the strength of his brickwork; that the superintendent is responsible for the existence of the defects in it, which were in view for many months; that the contractor is responsible for bad material and workmanship, and that under his contract no failure of either architect or superintendent relieves him of responsibility.

A BILL which has been brought before the Illinois Legislature shows that the innkeepers of that State have shrewdly resolved to take the bull by the horns, and if possible forestall the imposition of unwelcome restraints upon them. It is fathered by the Chicago Hotel Keepers' Association, and orders that the owners of every hotel of more than two stories high shall place "at the end of each hall above the first story, and accessible from each floor, a stationary iron ladder of sufficient strength to sustain a weight of not less than fifteen hundred pounds," or some other permanent fire escape, which shall be approved by town authorities, and must set a red light to show where it is. But that the first provision is so trifling as not to be worth disobeying, it might be a question how wide a door for evasion was opened by the alternative so vaguely set forth. These easy restrictions are buttressed by formidable penalties of fine and imprisonment; and the penal clauses are drawn with an air of relentless severity, which, considering the inoffensive character of the order they support, is diverting. The ladder device is here much less oppressive than the wire ladders provided for in the previous bill of which we have spoken, but is, like them, a ridiculous pretence as a substitute for the right kind of control over the building of hotels. We should be sorry to see such a ladder attacked by an excited crowd struggling to escape. It remains to see how much of such dust the Illinois Legislature will allow to be thrown in its eyes.

THE following letter has been sent to a number of architects in Boston; and since we know no reason why the architects of that city should be singled out for such favors, we may assume that it has been distributed elsewhere.

[Private.]

INDIANAPOLIS, IND., May 22, 1877.

MY DEAR SIR,—Our late Legislature passed an Act to provide for the building of a new State House. The Governor has just appointed the commissioners. If you will send me $20 I will forward you a complete copy of the law, the names and address of the commissioners, their advertisement for plans, etc., from time to time, and any other matter of interest to you in this connection. I think I could be of service to you. Truly yours,

JOHN W. BLAKE.

We shall not presume to offer any explanation of this letter: doubtless Mr. Blake has a satisfactory one for any architect who will send him his twenty dollars. But the interesting thing is the success of the new Indiana State House. People are beginning, in the light of recent experience, to see how important it is to get the best architects for their public buildings; and in view of the temptations offered by the Indiana Legislature to architects to put themselves under hundred-thousand-dollar bonds to guarantee that their work shall be perfection, and to assume all the extra costs of it while some one else has the authority over it, and considering the volunteer "service" of Mr. Blake, we may look to see such an eagerness of competition as never was before, among the ablest, most experienced, and most honorable men in the profession.

THE Royal Institute of British Architects has lost one of its most famous members, though his infirmities had of late prevented his being publicly active, by the death of Sir Matthew Digby Wyatt, better known simply as Sir Digby Wyatt. He was born in 1820, studied architecture in the office of his almost equally famous brother, Mr. T. H. Wyatt, and gained the prize for an essay offered by the Architectural Society when he was only sixteen years old. From 1844 to 1846 he travelled on the Continent, studying and drawing old architecture; and he began his career on his return by arranging and decorating the new Adelphi Theatre. He was associated with Sir Joseph Paxton and Owen Jones in designing the first Crystal Palace for the "World's Fair" of 1851, the building of which he supervised, and on account of which he received a gold medal from the late Prince Albert. When the "Palace" was transferred to Sydenham he superintended the fine-arts department and decoration of it. As one of the British jurors at the French Exhibition of 1855, he received the decoration of the Legion of Honor. In the same year he was made Honorary Secretary of the R. I. B. A., which he continued to be for four years. He received in 1866 the Royal gold medal, the highest professional honor bestowed upon architects in England, and was knighted in 1869, in which year he was also appointed to the Slade Professorship of Fine Arts at Cambridge, an office corresponding to that held by Mr. Ruskin at Oxford. He was a member of a number of learned and professional societies, English and foreign, among others of the American Institute of Architects, and had received a decoration from the King of Italy.

SIR DIGBY WYATT was not one of the leaders in the recent development of English architectural style. He never fell away from his early training, which was classical and Italian; and so far as we know he never followed in his architectural designs the modern mediæval styles, certainly not any of the vagaries that have been developed out of them. A great part of his architectural practice was in the service of the East India Company. His last important work for this company was on the new India Office in London, to which he was appointed, after the competition of a few years ago, in conjunction with Mr. — now Sir Gilbert — Scott, the archi-

tect of the Foreign Offices. It is as a master of decorative art and a writer upon it that Sir Digby is best known. His studies in this were necessarily in a great degree mediæval; and their influence on his architectural work was seen in a certain eclectic treatment of his Italian design. He was very much of a student, and made free use of the large professional library which he collected. His technical writings upon mosaics, illuminating, ironwork, and various industrial arts, and his lectures at Cambridge, are well known in his profession. His latest publication of any importance was the Architectural Note Book in Spain. The illustrations, somewhat roughly drawn by his own hand, hardly give indication of the masterly draughtsmanship which perhaps warranted him in once saying naïvely to an American visitor: "I suppose I can draw as well as any man in England; but a man cannot make drawings if he has work to do." His manner of writing is rather formal and cumbrous, but his essays are full of learning, good sense, and suggestion. He was an active and valuable member of the British Institute: the various volumes of its Transactions contain many valuable papers by him. One of his last public appearances at the Institute was when he presented to it at one of its meetings a portrait of his older brother, its former president, who still survives him.

ARCHITECTS will be interested in the question at issue between the Metropolitan Board of Works of London and the Royal Institute of British Architects, concerning the architectural treatment of Northumberland Avenue, one of the new thoroughfares which have been planned in the neighborhood of Charing Cross, and for which, making as it will the main avenue from Trafalgar Square to the Thames Embankment, Parliament some time ago authorized the purchase and condemnation of Northumberland House. As long ago as 1873 an act of Parliament provided that "the architectural elevations of all buildings to be erected under this act, fronting the Thames Embankment or fronting any street to be made under this act, shall be submitted by the Board to the consideration of the Council of the Royal Institute of British Architects, previous to the commencement of any such buildings." Submission usually implies control, and one would suppose that the obvious intention of such a provision was to secure the guaranty of the best professional oversight for the effective and harmonious treatment of the approaches to the embankment. But the Board, which has the reputation of being a hard-headed body, by no means disposed to surrender its privileges or invite interference, having, as we understand it, bought the site of Northumberland House and laid out its avenue across or along it, now proposes to sell out the abutting lots to private proprietors, and does not want its sales hampered by restrictions. The act which requires that the elevations shall be submitted to the Council does not distinctly require their approval, and the Board seems resolved to exceed the traditional possibility by driving not merely a coach and four but a whole thoroughfare through the act. It has presented to the Council for approval the elevations of buildings occupying a front of forty feet on one side of the new avenue. The Council naturally expressed unwillingness to commit themselves by sanctioning the independent treatment of so small a fraction of a frontage a thousand feet long, and suggested that the Board should present a design by which the general treatment of the whole should be governed with an eye to unity of effect; a proposition which would have seemed the most natural thing to a Parisian or a citizen of Vienna or Berlin. In answer to this the Board returned a resolution informing the Institute that while it could not carry out their suggestion of a uniform design for the whole street, it would take care that the rest of the designs should be in harmony with the first. The Board of Works and the Institute are not two bodies from whom a sympathetic co-operation was to be expected, especially if the first was to be a check upon the second; and though, according to the debate reported in the *Architect*, members of the Board were found wise enough to argue that Parliament had intrusted them with an important work which they were in danger of spoiling if they dealt with it piecemeal, the prevailing opinion seems to have been that absolute uniformity in a street — which was their interpretation of a general design — was objectionable, and that the "taste" of the Board was quite equal to the occasion. Whether the taste of the Institute was likely to be better, they did not seem to care to inquire.

INSECURE BUILDING.

THE accumulation of disasters to buildings during the last few weeks has awakened the public for the moment to a wholesome anxiety; and it has called out from many inconsiderate newspapers a storm of abuse against the architects of the country, as if they were all alike, none better and none worse than another, and as if they controlled all the bad building of the community. Considerate persons will not need to be reminded that architects are in their callings like other men, good, bad, and indifferent, and that if a building-committee or an individual client will go the right way to work, a good architect can always be secured. Admitting at the outset the facts that a thorough technical training is not so general among architects in the United States as it ought to be, and that half-taught practitioners and ignorant pretenders are much too common among them, — perhaps more so than in the older professions, though we are by no means sure of this, — facts to which we propose to return in another article, — we wish to suggest some other conditions that are overlooked by the public in its present excitement, while yet they are so important that as long as they remain unchanged there is no great hope that our building will be much better done than it has been.

In the first place it is not greatly worth while for people to complain that they are not provided with what they do not ask for. The public does not want good building, and therefore of course it does not get it. We do not mean that it declares no preference for good and substantial work over bad; but that it does not really demand the good, and is not willing to pay what it costs. It insists on building as cheaply as it can, and is readier to pay for show than for solid work. There is a standing complaint against architects that they are hard to control, and need constant restraint to prevent their spending excessively for architectural effect. But careful architects could generally say that it is quite as difficult to get their clients' consent to really first-rate construction as to a free expenditure for display. Architects, as a class, are not exempt from the common preference for show over substance: they like solid work however, and where they do not urge the kind of construction that they would like to use, it is often simply because they know that their proposals would not be listened to for a moment, or that if their designs were estimated according to their ideas of the best kind of construction, they would be rejected at once. The popular demand for cheap building and the desire for display are overwhelming, and carry almost every thing before them. Every one who puts up a building of course means that it shall hold together, for otherwise it would be useless — except where it is intended for immediate sale to the unwary. But he wants to do this as cheaply as he can, and is usually ready to assume a risk of insecurity in so doing, often not expecting his building to last many years, and forgetting that to make it really safe for one year it ought to be built to last a hundred. This desire to cheapen building encourages a hundred economizing inventions of the building-trades, and architects are forced to employ them, or at least are made indulgent to them by the popular pressure. The whole country — and indeed all other countries as well — is full of inventions for making a cheap substance do duty for a more costly one, or a little of one material serve instead of a great deal. These things employ an enormous amount of inventive labor, and this certainly not from the enthusiasm of inventing, but because there is an enormous and imperative demand for them. People are not wanting to argue that their cheap substitutes are better than the dearer originals. We have heard men argue that wood papers on plaster were better than wooden wainscoting, because they did not shrink. We remember a gentleman who had built a row of cottages on balloon frames, which had not a mortise or tenon among them, who boasted that they were "the stiffest houses in town," and that one might be rolled down hill without hurting it. He did not build them however, because he was an enthusiast for balloon frames, but because he wanted to save his pence. Somehow or other the cheap substitutes are never found to do the work of the

things they supplant, and the people who employ and laud them do not at heart think they will: they fancy that they will "do," and they are willing to run a certain amount of risk.

People will have their great warehouses and conspicuous shops, their gilded hotels and theatres, and their showy houses. They must spend money to make them attract attention; they expect in this country a large return for their money invested; and when the expenditure of money brings neither rent nor consideration nor immediate comfort, they are very sparing of it. If a man errs a little in building on too large a scale or too ornately, he has at least for his return a little more space at command, or some additional gratification of his sense or his vanity; but if he puts an extra thousand of bricks into his walls or another thousand feet of timber into his floors, or a ton of iron into his beams, it has entirely disappeared to his eyes, and to most persons' judgment it is lost unless it can be shown to be needed to hold his building together as long as he wants to use it.

What wonder then that this haunting desire to save in construction continually tempts people to build as slightly as experience shows them that they can build with safety? that it makes employers look askance at expensive precautions, the necessity of which they can only take on trust? that it brings upon architects and builders a constant and dangerous pressure, urging them to keep as close as they can to the narrow but more or less indefinite line that divides security from danger, and leading to frequent transgressions of it?

The truth is that Americans as a people are not yet educated to a knowledge of the cost of good building. The whole mass of our building is of a kind that would be considered inferior in the older countries of the world. There are very few structures in any of our cities that would satisfy the building-laws of Paris or Vienna. Their cost in money has been high because materials are dear here, wages are high, and the hours of work short. But measured by the amount and quality of material and the work put into them, American buildings would rate very low in any European city. There has always been a hue and cry at the cost of our public buildings. There is no doubt that on many of them a great deal of money has been wasted by mismanagement; but setting aside some conspicuous failures, they have been, with few exceptions, the really good buildings of the country. Apart from jobbing, of which we suspect there has been much less than is commonly imagined, the impression is common that a great deal of money has been wasted in the actual labor and material consumed in them; but we believe very little of either has gone into them that would not have been thought essential in any country in which sound building was the rule. And their cost is really due, still with some exceptions, less to efforts at architectural magnificence than to what has been spent for the sake of thorough workmanship and sound and abundant material. If private buildings were undertaken on the same scale and with the same thoroughness, we think the cost of them would approximate surprisingly to that of the abused public work. Doubtless we shall in due time grow up to such standards of good buildings as are enforced by the experience of older nations. Then we shall find that our buildings will cost us more than they now do; but our recompense will be in the fact that they will be valuable and permanent possessions.

So long as there is no restraint on the demand for cheap and showy buildings; so long as clients come to their architects insisting on having more for their money than it will fairly pay for; so long as they require that their work shall be given to one man rather than another, simply because he will do it for less, without taking account of his habits of working; so long as they are content to put up buildings which they expect to last only a score of years, and prefer to risk their burning rather than to pay for making them incombustible, or their falling rather than to make them solid, — as older nations make them, — so long must we expect that the risks thus voluntarily incurred will turn out disastrous; and every now and then we shall be shocked by the news of a catastrophe like that of Rockford or Brooklyn. And as it is in the order of Providence that the innocent shall suffer for the guilty, the people who incur the risks will not monopolize the penalty. Speculators will keep on selecting incompetent or dishonest agents, and building treacherous buildings, unless they are restrained by law; and when the buildings burn or fall, the persons who are killed in them will be not the speculators but the public. But if the real danger is the public's, the power to control the danger also belongs to it, in its law-making capacity. To that it should look, and not waste its energies in scolding.

REPORT OF THE EXPERTS UPON THE ROCKFORD COURT HOUSE DISASTER.

To J. D. BURNS, ESQ., *Coroner of Winnebago Co., Ill.*

As requested by his Honor the mayor of the City of Rockford on behalf of the coroner of the county of Winnebago, and the jury now engaged in investigating the failure of the Court House in the city of Rockford on the 11th inst., we have carefully examined the plans and specifications of the building, the contract for its construction, the building itself, and the materials of which it is composed; and we have the honor to submit the following report of the results of such examination.

The plans and specifications have been very carefully drawn, with the exceptions of a few omissions. These plans and specifications are however not of themselves sufficient to control all important details, and could not be relied upon alone to secure a safe and judicious construction of the building, unless supplemented by the constant supervision of a thoroughly competent architect or superintendent as provided for by the contract.

The contract is very clear, explicit, and comprehensive. Henry S. Gay is in such contract recognized as the architect with the full supervisory powers and functions usually incident to such office. But it is further specified that there shall be a superintendent appointed by the supervisors, yet subordinate to the architect, whose specific duties and responsibilities are thus defined: "The superintendent shall at all times promptly and without delay object to any work or material proposed to be incorporated in said building, or being incorporated therein, whenever in his judgment the same shall not be of the style or quality of work, or the kind, quantity, or quality of material, required by the plans, drawings, specifications, or terms of this contract." The contractor assumes all the risks incident to the execution of the work of any kind whatsoever, and he is required to consult with the architect relative to matters that are not fully detailed or explained on the plans or specifications. By this it will be seen that the duties and responsibilities of all the parties concerned in the building are explicitly set forth. The architect is responsible for the correctness and sufficiency of the plans and specifications; the superintendent for seeing that nothing contrary to such plans and specifications is done, and giving immediate notice of such errors; while the responsibility of the contractor for the results of any errors or deficiencies is general. The architect has power under the contract to make any changes in the plans or specifications which may appear to him necessary; and the contractor is bound to execute the work according to the plans and specification so changed. The architect is to make monthly estimates of the materials furnished and labor done; and if an architect and superintendent, having been employed, had faithfully performed their duties as prescribed by the contract, it seems to us next to impossible that any serious defects in materials or workmanship could have crept into the building. We have made a careful examination of the building in its present condition in connection with the plans. The sides and back of the main pavilion with the front pediment have fallen, carrying down almost the entire interior and roof comprehended within the bounds of the court-room. By this examination we discover that nearly half of the pavilion was supported by two cast-iron columns.

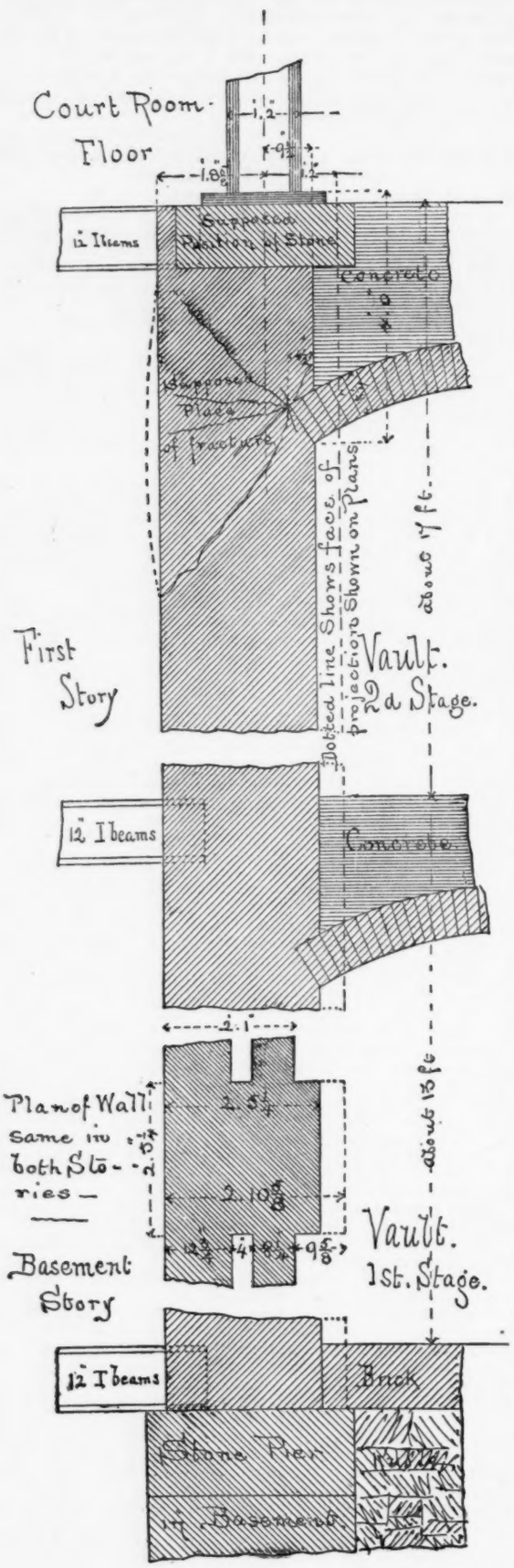
The iron columns were of ample strength to carry the load intended to be placed upon them. The columns had cast-iron base plates two feet square and two inches thick.

These columns rested on a brick wall extending from the ground floor up through two stories thirty-one feet in height.

The foundation wall in sub-cellar and footings are of ample strength and dimensions.

The material upon which the foundation rests is a compact, incompressible bed of gravel of sufficient depth.

The plan shows the wall from the top of the ground floor to base of column to be a double wall twenty-five inches thick, composed of a wall 12¾ inches wide on the west side, and another 8¼ inches wide on the east side, with a space of four inches between. This wall forms one side of a double tier of fire-proof vaults, the roofs of which are of groined arches eight inches thick, of brick levelled up with concrete. The particular place where these columns stand is indicated by a projection on the east side into the vaults of 9⅜ inches, which is two feet four inches wide. This part of the wall is shown hollow, but was built solid from the foundation up; and this portion is figured on the plans to be two feet four inches from north to south, and two feet 10⅝ inches from east to west. A wrought capstone was provided for in the specifications (see p. 10, printed specifications), at the top of this part of the wall, and the specifications call for "all necessary bond stones for interior work." At this place in the wall the first departure from the plans was observed, from which in part has resulted the failure of



SECTION OF WALL AND COLUMN.

the construction, — on the north side of pavilion, which was seen to fall first. The projection on the east side of wall under the iron column, instead of being made 9⅜ inches, is by measurement only five inches. The size of the solid part as built, including the projection, is two feet five inches by two feet five inches.

At the level for arches over the first stage of vaults a skewback is cut into this projection five inches deep, and also in the part of the wall remaining in corresponding projection under the south corner of pavilion on the second stage; from which it is fair to presume that a similar skewback was cut into the projection under the columns on the second stage. The proper level for the lower line of the skewback, according to the plans, was four feet below the top of the wall. The wall in this place, which was the first point of fracture, is broken down through two-thirds of the height of the second stage of vaults. The cutting for skewbacks reduced the area of the solid part under column by 115⅜ inches, leaving the available part of the solid brickwork for effective service in resisting the load 4.8333 feet. The area called for by the plans was 6.7326 square feet.

It is said that there was a capstone on the wall, the dimensions of which are not known to us. The portion of the wall remaining has been critically examined by us. We found it badly shattered and of very defective material and workmanship. The bricks used in this portion, and generally throughout the building, are weak, very porous, and so soft as to be easily cut with a knife. The sand used in the mortar is of excellent quality, clean, coarse, and sharp. Little or no cement appears to have been used; and in most places the mortar appears deficient in strength, either from want of the proper quantity or quality of lime used, or from too rapid absorption of the water it contained, by brick laid dry. That the brick were laid too dry is evident from the fact that in most instances the mortar does not adhere to the brick, those taken out of the work being clean, or nearly so. The neglect to properly wet the brick was more serious in this case, as their capacity to absorb water is extraordinary. One of the best bricks that we could find in this wall, taken from its heart, weighing 3 pounds, 13¾ ounces, absorbed 14 ounces of water in 5½ hours, being over 22½ per cent of its weight; whereas a good brick should not absorb more than $\frac{1}{15}$, or 6⅔ per cent of its weight, this being less than one-third of the amount absorbed by the specimen in question.

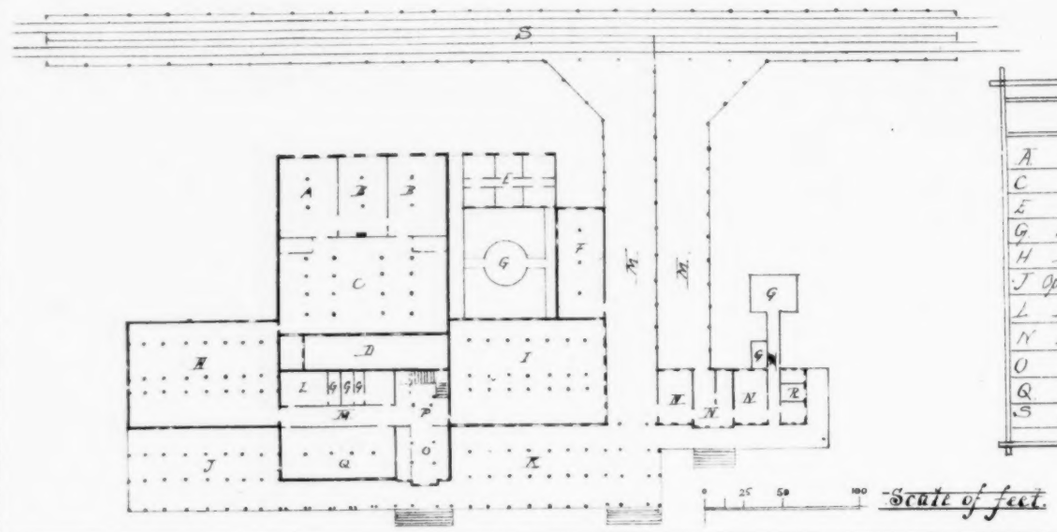
While these facts render it apparent that the brick in question is entirely unsuitable for use in the construction of a building the character of the one under consideration, and where great strength is required, they are good brick for ordinary work.

The workmanship was found to be careless and imperfect. The thickness of the joints is excessive, with improper and imperfect bond; head and side joints many of them not filled with mortar, and no evidence of grouting having been done. The heading courses in places seen did not run through the full thickness of the wall. The failure to comply with the specifications will be evident by reference to the following extract: "All of the interior walls and backing to the stone will be of hard-burned brick of clear ring, firm and solid, and to be laid in mortar of lime and cement, and thoroughly grouted; the brick to be thoroughly soaked if laid in dry weather, and to be thoroughly set in mortar, and bonded together, headed every fifth course. The mortar to be of the best quality fresh hydraulic cement finely and properly ground, and fresh burned quicklime, mixed together thoroughly with clear sharp river or pit sand, free from loam or other foreign substances; the proportion of the different materials composing the mortar depending strictly on their quality, and cannot be definitely determined until tested. It is considered that the lime, cement, and sand can be used in equal quantities. The lime must be thoroughly slacked before it is mixed with the sand, and the cement added to the mortar at the time of using on the wall; no more cement to be prepared with the mortar than can be used by the bricklayers in each half hour. Mortar-joints not to exceed three-eighths of an inch."

Our observations convince us that the first failure of the wall took place at a point under the column at which the wall was weakened by the upper skewback cut into it. The wall yielded by crimping on the side containing the skewback, and bulging on the opposite side. This method of yielding was rendered more certain by the position of the column, its axis being as indicated by the plans, 3¼ inches from the centre of the wall in the direction of the skewback.

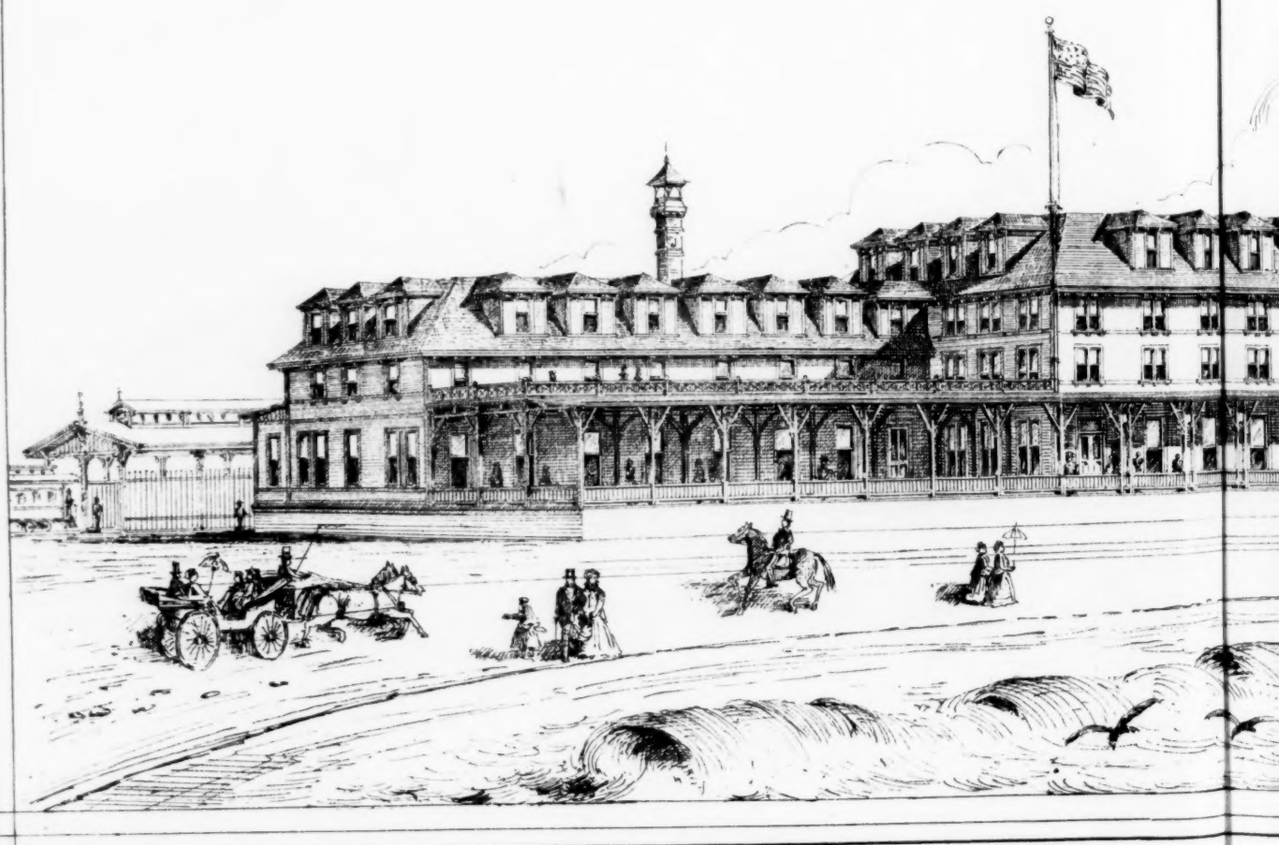
The omission of 4⅜ inches from the projection on the vault side intended for its better support, and the cutting of the skewback practically reducing that side of the wall by 9⅜ inches, really left the axis of the column $8\frac{5}{16}$ inches off the centre of solid brickwork as built. That the wall did thus fail is further evident from the situation of the column as it now stands, the bottom being nearly under its original position, the top resting against a portion of a wall that remains standing.

We carefully computed the weight to be borne at the base of one of the iron columns above mentioned, from the data furnished by the plans and specifications, and the measurement of a portion of the work at the building. The information we have obtained has not been sufficient to enable us to make an absolutely accurate calculation of this weight, but it is believed to be a very close approximation to it. It has been found to be $147\frac{68}{100}$ tons, as is shown by the following statement in detail: —



Plan

A	Bakery	B	Laun
C	Kitchen	D	Area
E	Stores	F	Bar
G	Water Closets	an	Toile
H	Dining Hall	I	Lunch
J	Open air do	K	pen air
L	Ladies' R.	M	Pass a
N	R.R. Station	and	uting
O	Office	P	Plan
Q	Parlor	R	Sleepin
S	Train Sheds	bo	Lon



HELIOTYPE

MANHATTAN BEACH HOTEL.

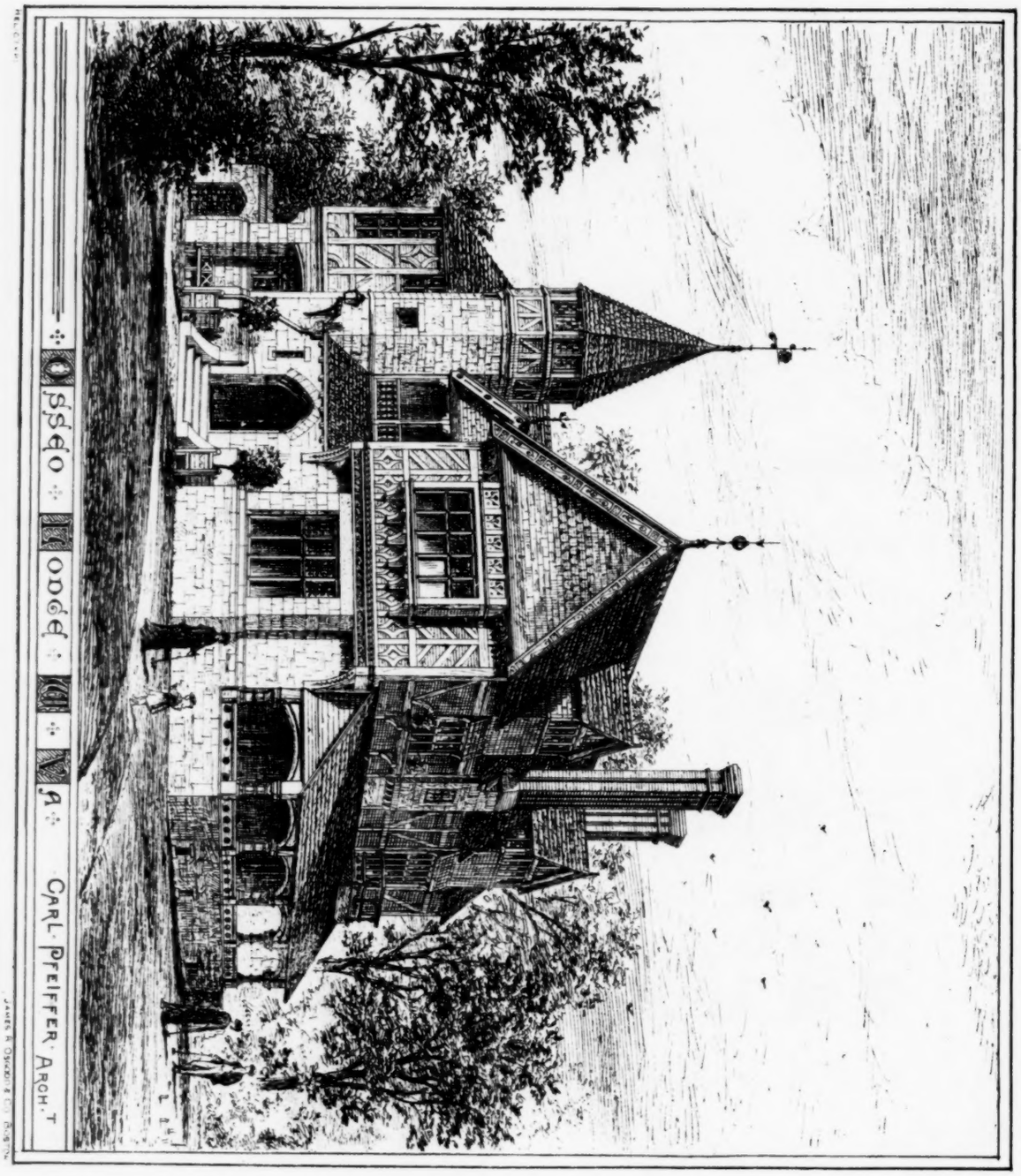
J. RICKERING PUTNAM, ARCHITECT, BOSTON.

Plan.

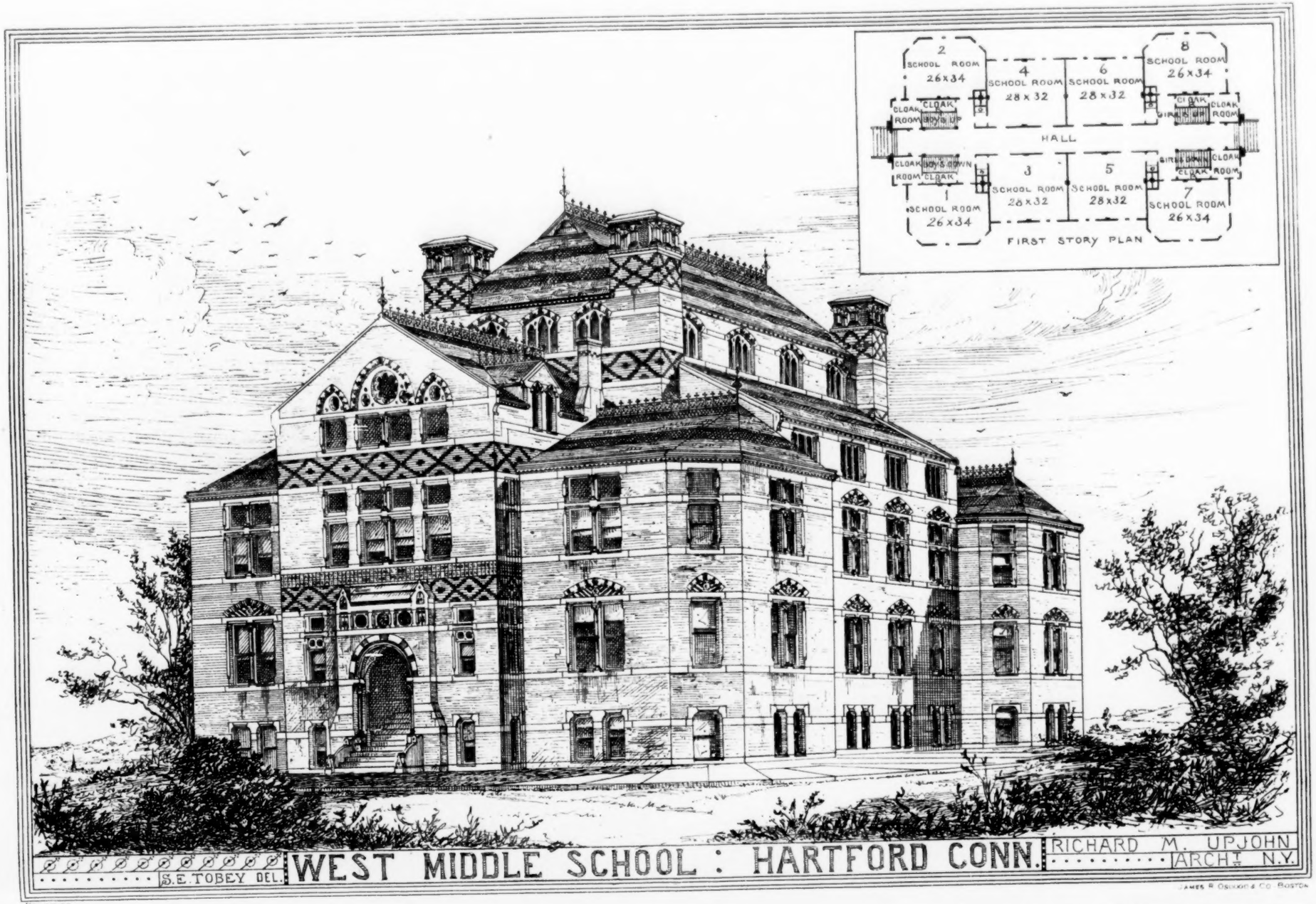
S. Laundry.
D. Area.
F. Bar.
and Toilets.
I. Lunch Hall
K. open air do.
M. Passage.
and Waiting Rooms
P. Main Stairs.
R. Storing Rms.
Long -

F. M. Hunt. Del.

JAMES R. OSGOOD & CO. BOSTON


OSSEO · MINN ·
CARL PFEIFFER ARCH.T

American Architect and Building News. June 2. 1877



S.E. TOBEY DEL.

WEST MIDDLE SCHOOL : HARTFORD CONN.

RICHARD M. UPJOHN
ARCHT N.Y.

HELIOTYPE
JAMES R. OSGOOD & CO. BOSTON

1 iron column with cap and base plate	6,189 lbs.
1 short column over it	373
Plates for short column	115
Consoles	455
Shell cap	120
Shell base	460
Iron girders for pavilion of dome	4,469
Iron girders for ceiling	1,360
Brickwork under pavilion at 112½ [lbs. per c. f.]	13,664
Brickwork with ashlar facing under dome at 125 [lbs. per c. f.]	36,135
Stonework of cornice and pediment	114,172
Weight of portions of vault roofs resting on pier	6,075
Weight of iron I-beams in tower floor	1,105
Truss beams under side roof of court-room	402
Truss beams under side roof of court-room timber	1,560
Hip rafters	500
Truss for skylight opening and header	800
Anchors in tower 200, and chains 317	517
Weight of anchors and concrete in tower floor	8,190
Roof and roof covering at 45, and accidental weight at 20 [sq.ft.]	59,280
Weight of ceiling at 15 lbs.	20,609
¼ of skylight and glass	490
Finial, clock, and ribs in pavilion (estimated)	1,000
Load on floor over vault at 80	600
Weight of additional thickness of pavilion wall	16,576
Tons $147\frac{578}{1000}$ =	295,157 lbs.

Force of greatest wind adds weight to one column of about 7¼ tons.

According to the plans there was provided to sustain this weight an area of 6.7326 square feet. We estimate the safe load to be borne by brickwork of the quality required by the specifications at twelve tons to the square foot, giving a bearing capacity to the solid part of wall of $80\frac{79}{100}$ tons, as against the load just mentioned of $147\frac{578}{1000}$ tons, showing an excess of load over safe sustaining power of $66\frac{79}{100}$ tons. This load would have put a weight of $21\frac{9}{10}$ tons on each square foot of brickwork, or an excess of $9\frac{9}{10}$ tons over safe load. For this over-estimate of the strength of the brickwork, we think the architect who made the plans and specifications is responsible.

Rankine after describing an excellent brick says, "A small pillar of brickwork made of bricks of this quality laid in cement should require from 800 to 1,000 lbs. on a square inch to crush it." Taking the mean of these two figures, namely 900 lbs. per square inch, and we have for the ultimate strength of brickwork per square foot, 129,600 lbs. or $64\frac{8}{10}$ tons. Now taking ⅙ of this as the safe load, and we have as the admissable load on the brickwork in question $10\frac{8}{10}$ tons per square foot. The department of public works in Berlin allows as safe load a pressure of 200 lbs. per square inch where the best of bricks and cement are used. This is equivalent to $14\frac{4}{10}$ tons per square foot.

The practice of architects in this country we think will justify us in assuming as the safe load on brickwork of the character set forth in the plans and specifications before us, twelve tons per square foot; this limit lying nearly midway between the British and German practice as above set forth. We see from these facts there would have been great danger of failure even if the brickwork had been of the quality described in the specifications, and of the dimensions shown on the plans. It may be observed however, that had the whole wall been of the quality of materials and work specified, the weight would have been distributed over a larger surface of the wall from the base of the column downward, and so the danger of failure lessened; a result not relied upon in correct practice unless for special reasons and provided for. We remark that parts of walls upon which these columns stood, being obliged to carry greater weights than any other part of the brickwork, should have received from the architect under any circumstances special attention as to their design and erection.

We will now consider the conditions which would have existed at the time of the failure of the work, had the plans and specifications been complied with. The actual weight at that time at the base of the iron column, as computed by us from the same data from which we have computed the ultimate load, was $102\frac{494}{1000}$ tons. Taking the safe load at 12 tons as before, giving a bearing capacity to the solid part of the wall of $89\frac{79}{100}$ tons, we find that there would have been an excess of load over safe sustaining power of $12\frac{764}{1000}$ tons. The actual load per foot would have been $15\frac{22}{100}$ tons, or an excess of $3\frac{22}{100}$ tons per square foot over safe load.

The omission of a portion of the projection as provided for on the plan, and the further reduction of the area of the wall by the cutting in of the skewback, reduced the area to 4.8333 square feet. This area had a weight to sustain at the time that the accident occurred of $102\frac{494}{1000}$ tons, which amounts to $21\frac{207}{1000}$ tons per square foot, or an excess of $9\frac{297}{1000}$ tons above safe load of good brickwork. Under this excessive load the wall failed, a result clearly traceable to excessive load, bad material, and faulty workmanship.

RELATING TO PRACTICE.

1. The architect, having enjoyed full supervisory powers over superintendent and contractor, should have visited the work as often as was necessary in his judgment, to detect and provide against any serious deviation from the plans, specifications, and contract. He is responsible for his opinions in approving the employment of any particular material.

2. The fact that soft and weak bricks were employed made it all the more the duty of the superintendent to exercise proper diligence in seeing that they were well laid. The almost uniformly bad nature of the brickwork shows that this cannot have been the case, or at least that whatever he may have done in this respect was inoperative.

3. The soft and weak bricks being employed, the contractor is all the more responsible for laying them in a negligent and unworkmanlike manner, thereby adding to rather than ameliorating the deficiencies of the brick.

GENERAL CONCLUSIONS.

From the information obtained by us from the contract, plans, and specifications, and examination of the building, we have been led to the following conclusions: —

1. That the architect has failed to make a sufficient calculation of the necessary strength of the brickwork in the parts of the building under examination, to sustain the ultimate load. That had the provisions of the plans and specifications been complied with, while we would not deem it wise construction, the margin that exists between safe load and ultimate strength is such as to render it probable that failure would not have occurred as it did. This margin should be preserved as provision against accident from extra strain or shock from wind or other causes. That the imperfections existing in the work, and the non-compliance with the plans and specifications, could have been detected at any time up to the erection of the brickwork of pavilion wall, in time to avert the disaster by proper remedies.

2. That the superintendent in charge of the work was responsible for the existence of these defects, they having been in clear view for many months.

3. That the contractor is responsible for the non-compliance with the plans and specifications, and the defects in the materials and workmanship; and under the contract, the failure of the superintendent or architect to notify him as to these deficiencies and order the work to be stopped, does not relieve him of the responsibility in the least.

4. That the appointment of a superintendent by the Board of Supervisors and not by the architect, and the placing thereby of the responsibility for the faithful performance of the duties of the superintendent upon the Board of Trustees and not on the architect, is an example of bad practice in the administration of the construction of public buildings.

(Signed) EDWARD BURLING, *Architect.*
WM. SOOY SMITH, *Civil Engineer.*
P. B. WIGHT, *Architect.*

Sworn to before the coroner and jury, May 17, 1877.

SUPPLEMENTARY REPORT.

To J. D. BURNS, ESQ., *Coroner of Winnebago County, Ill.*

In accordance with the request of the jury now investigating the cause of the fall of a portion of the new County Court House, we have examined the three sets of drawings submitted to us, namely, one set on paper, comprising the general floor plans, elevations, and sections, ten in number, called the "architect's plans;" another set of plans on tracing muslin, ten in number, and also comprising the general floor plans, elevations, and sections, called the "county's plans;" and another set comprising the foundation plan and the first story plan, on tracing muslin, called the "contractor's plans."

We compared these sets of plans together to ascertain points of correspondence and divergence between them, as well as to find the proper constructive correspondence or divergence between the respective drawings.

The following notes were taken in the order in which the drawings were examined: —

Foundation Plan. — There were no discrepancies between the architect's and county's plan, and a few omissions of figures on contractor's plan.

First Story. — Portion of wall sustaining pavilion columns shown hollow on county plan, and lines of hollow space drawn through on contractor's plan; *the space between on the contractor's plan being colored.* Lines on county plan drawn across wall and figured 2′ 4″ apart on east support for pavilion, and not figured on west pier. On contractor's plan a line drawn full across the wall on the west side of each pier, and a line broken by a dot on the east side of each pier. The lines are figured 2 feet 4 inches apart on the east pier. The distance of these lines apart on the west pier is not figured. There were no discrepancies between the architect's plans and the county plans in these piers. Pencil marks on the hollow space were seen on the architect's plans. There was an omission on the county plans of figures on architect's and contractor's plan, showing distance of centres of south piers from inside of corridor walls. The county and contractor's plans of this story are undoubtedly tracings from the architect's plan.

Basement. — On the architect's plan, the lines drawn across the walls of parts supporting pavilion are dotted lines, with full lines drawn over. On the county plans, the corresponding lines are dotted lines.

The Court-Room Floor. — On the east side of court-room, the figures of spaces between the centres of central brick pilasters are each figured on architect's plan 15′ 11½″, and on county plans 15′

11½″, making the sum of both spaces ⅛ of an inch greater on county plans than on architect's.

The general figures across court-room on the opposite side show a total length of 78 feet 2 inches on both plans, and the additional length of ⅛ of an inch is indicated in a line of detail figures on the county plans only. No other discrepancies in figures were found between the architect's and county plans of this story; but there were a few omissions on the county plans of figures seen on the architect's plan. No discrepancies except those above noted were found between any of the plans submitted to us.

The signatures of the Building Committee are on all the architect's plans and all the county plans.

Respectfully submitted,

EDWARD BURLING, *Architect*,
WM. SOOY SMITH, *Civil Engineer*,
P. B. WIGHT, *Architect*.

(Submitted while under oath as witnesses.)

THE ILLUSTRATIONS.

HOTEL AND RESTAURANT FOR THE N.Y. AND MANHATTAN BEACH RAILWAY COMPANY. J. PICKERING PUTNAM, ARCHITECT.

(4 Pemberton Square, Boston, Mass.)

THIS building is now in process of construction on Manhattan Beach belonging to the Company, east of the ocean concourse on Long Island. The beach, over two miles in length in a gentle curve, is one of the finest on the Atlantic coast, and will this summer be readily accessible from any part of New York and Brooklyn in about half an hour by ferry and railroads now approaching completion. The hotel is to be built on hard pine piles or posts 8″ and 12″ in diameter, with a very heavy frame, strapped with iron to the piles and well braced and trussed to withstand the severest winter gales. Its total length outside of every thing will be about five hundred feet, and the total depth from front to rear is nowhere less than two hundred and twenty-five feet. Behind the hotel proper is a train shed for the arrival and departure of trains, with a wide passage-way to the front. The building contains a large dining-hall 68′ x 100′, and restaurant and lunch-room of the same dimensions. In addition to these are to be open-air dining and lunch rooms of nearly equal capacity, they being of the same character as those which proved so popular at the Centennial Exhibition at Philadelphia. There are to be one hundred and fifty sleeping-rooms, besides numerous private dining-rooms, parlors, etc. The kitchen accommodations are of the amplest kind, being sufficient in capacity to provide for at least ten or twelve thousand persons daily. The total cost of the building completed will be about $100,000. The towers will contain colossal water-tanks for the ready distribution of water to all parts of the building in case of fire; and the building is to be provided with steam radiators for winter use, with electric bells, gas, and plumbing.

WEST MIDDLE SCHOOL, HARTFORD, CONN. MR. R. M. UPJOHN, ARCHITECT.

(Trinity Building, New York.)

The West Middle School is built of brick with Cleveland stone wrought work. There are four floors; the basements for play-rooms for the children, for furnaces, and for other conveniences. The ground floor and second stories are divided into eight school-rooms, each room accommodating fifty pupils. All the rooms are perfectly lighted, heated, and ventilated. Proper cloak-rooms are provided for each of the rooms. The staircases are at each end of the building. The top floor is appropriated for an exhibition-room, and is about sixty feet square. There are no wooden partitions in the building. The cost of the building with the steam-furnaces was $100,000.

OSSEO LODGE, W. VA. MR. CARL PFEIFFER, ARCHITECT.

(113 Broadway, New York, N.Y.)

PROFESSIONAL PRACTICE AND CHARGES OF ARCHITECTS.

IN answer to the request of a correspondent in Ottumwa, Io., who wished us to publish in our columns "a list of the latest architects' prices," we give the charges that are usually and properly made and indorsed by the American Institute of Architects.

For full professional services (including superintendence), 5 per cent upon the cost of the work.

Partial service as follows: —

For preliminary studies, 1 per cent.

For preliminary studies, general drawings, and specifications, 2½ per cent.

For preliminary studies, general drawings, details, and specifications, 3½ per cent.

For stores, 3 per cent upon the cost, divided in the above ratio.

For works that cost less than $5,000, or for monumental and decorative work, and designs for furniture, a special rate in excess of the above.

For alterations and additions, an additional charge to be made for surveys and measurements.

An additional charge to be made for alterations or additions in contracts or plans, which will be valued in proportion to the additional time and services employed.

Necessary travelling expenses to be paid by the client.

Time spent by the architect in visiting for professional consultation, and in the accompanying travel, whether by day or night, will be charged for, whether or not any commission, either for office work or superintending work, is given.

The architect's payments are successively due as his work is completed, in the order of the above classifications.

Until an actual estimate is received, the charges are based upon the proposed cost of the works, and the payments are received as instalments of the entire fee, which is based upon the actual cost.

The architect bases his professional charge upon the entire cost to the owner of the building when completed, including all the fixtures necessary to render it fit for occupation, and is entitled to a fair additional compensation for furniture or other articles designed or purchased by the architect.

If any material or work used in the construction of the building be already upon the ground, or come into possession of the owner without expense to him, the value of said material or work is to be added to the sum actually expended upon the building before the architect's commission is computed.

Drawings, as instruments of service, are the property of the architect.

By order,

RICHARD UPJOHN, *President*.

A. J. BLOOR, *Secretary*.

CORRESPONDENCE.

THE BRICKMAKERS' STRIKE. — THE CAPITOL APPROPRIATION. — THE KELLUM LAW-SUIT. — A PRIVATE RESIDENCE. — OVERSIGHT IN REBUILDING. — ALMOST AN ACCIDENT.

NEW YORK.

THE brickmakers are running riot at the brickyards up the Hudson. Haverstraw has been in a state of siege for several days past; the streets thronged by groups of the lowest grade of brickyard employees. There has been a succession of strikes in the yards of late. The old men went out on strike, new men took their places; then another turn brought back the old hands at the reduced wages offered by the yard-owners; and then came a general uprising, the new men, re-enforced by delegations of roughs from this city and from the towns of the Hudson, making visits from yard to yard with clubs and stones, compelling a cessation of labor, overturning tiers of green brick, until out of fifty or more yards less than half a dozen have been unmolested. The militia have been called out to keep the rioters within some bounds, but thus far neither arson nor manslaughter has been committed. On Friday, 25th inst., a meeting of yard-owners was held, and the following determination unanimously carried: —

Resolved, That the scale of wages adopted by the brickmakers this spring be strictly adhered to; to wit, thirty-eight dollars for sanders, moulders, and dumpers, and thirty-five dollars for kiln-shed men.

Some were in favor of closing the yards; and judging from the quantities of brick in stock, and the slow demand, no great inconvenience would have been felt, had this been carried out; but objection was made that a lock-out would deprive the willing ones of the opportunity to work. It was resolved, against the usual custom of full monthly payments, to pay off the men what was due them for the current month up to the date of the strike. Thus far the strikers have been treated very leniently; but the prospects are that within a few days a number of arrests will dampen the ardor of the mob, and the great Haverstraw yards be once more in operation.

The Albany Capitol has received an allowance of $500,000, after the $1,000,000 appropriation had received a very flat-footed veto from the governor. The advocates of the Capitol extension roused up the Albany mob to a very noisy display of lobby tactics; and the governor, despite his opinion that a delay of a year on the Capitol work would work no injury to the public interest, very meekly agreed to a compromise of half a million dollars.

The Kellum case has advanced another stage through its law course. This, it will be remembered, was a suit brought by Hannah Kellum, widow and executrix of Mr. John Kellum, architect of the new Court House, so intimately associated with the Tweed robberies. His compensation was fixed at three per cent of the entire cost; and large sums were paid on account, Mrs. Kellum suing for the remainder. The city defended on the ground that it had been subjected to needless expense by reason of the unskilful manner in which the work had been performed under the direction of architect Kellum, the damage to the city resulting therefrom exceeding the claim put in. Evidence was put in on the several technical grounds sustaining the city's defence, and a verdict was rendered against the Kellum claim. From this judgment an appeal was made to the general term of the court; and a few days since, the opinion of the court written by Judge Daniels held that the defence was legally made out, and says that services of this kind, if undertaken, the law requires to be exercised with

care and skill commensurate with the undertaking. The audit of the bills claimed by the supervisors was no bar to going behind the audit into the question of skilfulness.

Jardine Brothers have in hand a residence for J. A. Bostwick, corner of Sixty-first Street and Fifth Avenue, on a plat 30 x 100 feet. A three-story and mansard roof residence is to be erected at a cost of over $100,000. The plan is not peculiar, having the usual stoop and corridor with stairs, flanked by the parlors 36 x 14 feet, and dining-room 14 x 23 feet. The basement has billiard-room 25 x 19 feet, with kitchen. Service stairs are provided at the rear of the building, with an hydraulic passenger-lift. For working this, a supply of water has been provided in a vault capable of holding 16,000 gallons, a pump forcing the water to a tank in the attic, the fall again working a series of buckets, and giving power to the elevator. The fronts of the upper floors are thrown into large rooms, a sitting room on the second, and a play room on the third floor. The floors are laid with iron beams and fire-proof filling. Steam heating will be employed, and from the boiler in the cellar a series of pipes will be laid under the sidewalk flagging, into which heat may be turned to melt the snow falling upon it. The finish within is to be in cabinet work throughout, without regard to expense; nothing is to be spared. The stairway is to be carried up in marble, with bronze hand-rail, elaborate wall decoration and fresco. Without, Connecticut brown stone is alone employed, excepting only a pair of polished granite columns flanking the main entrance. The stonework in place of the usual four-inch veneer blocks is to be solid with chamfers and returns of windows, etc., on the solid block.

The Building Department has recently been taken to task for its blindness in not seeing a violation of the law in the erection of a business building on Crosby Street on a portion of the plat burned over by the great 444 Broadway fire in February, 1876. One complaint then was that the great interior spaces of the building created such a volume of fire as to defy the efforts of the firemen. Except in cases of theatres and other public buildings the law requires a solid brick bearing wall at intervals not greater than fifty feet. In the Crosby-street structure iron columns were used, the intercolumnar spaces filled in with concrete blocks; and it was not until the Insurance Board advised a refusal to write policies on the building that the Building Department roused itself to order a change.

From Binghamton in this State comes a strange story which should teach the necessity for a periodic inspection of all public buildings. On Friday the great five-thousand-pounds bell hang-in the tower over the front vestibule of the First Presbyterian Church did not work as usual; and the sexton ordered Mr. William Scott, a neighboring mechanic, to go up and correct the wrong. A hasty examination showed that the clapper was loose; and this was fastened back, and the bell tolled on Sunday with a separate hammer, without rocking the bell. On Monday Mr. Scott went up to make a more thorough inspection and repairs; to his surprise he discovered that the head of the bolt upon which the bell was suspended from the rocking-bar was broken off and the whole mass of metal held only by a slight swell in the bar, and that this too had nearly pulled through. A single half-turn might have brought the whole down to the destruction of the great organ and the very possible loss of life in the church lobby below.

THE CENTRAL PARK.

NEW YORK, May 19, 1877.

TO THE EDITOR OF THE AMERICAN ARCHITECT.

Sir, — I have hesitated to recur to the matter of my former brief note, but submit that the credit of the profession your journal represents is enough concerned to justify the publication of a fuller statement of the facts which prove to be in question. The case is this: The Institute of Architects had published an interesting paper prepared by its Secretary for a national and international occasion, and which was likely to be preserved abroad and at home as an abstract of the history of architecture in America. Its compiler, living in New York, had given special consideration to the work of his contemporaries of that city, which he registered by decades. Half the space of the sixth decade he thought proper to appropriate to the Central Park, in the account of which I was credited with all that is respectable of the general design, and Mr. C. Vaux as holding a consulting and somewhat questionable position with reference to the architecture only.

Regarding this account as defective from inadvertence, I could not do less than supply the brief correction which you published on the 14th ult. It appears, however, from the note which it has drawn out, that there was no inadvertence, and that it is still believed that in all particulars of special interest to architecture the record is authentic and complete.

In my judgment, if the design of the park has any special interest to architects at all, it lies in a few circumstances which have been thus wholly lost sight of, and which, to relieve them for the moment as much as possible from any personal bearing, I will narrate as follows: —

Years ago a young English architect, returning from a professional tour on the Continent, contributed drawings to an exhibition in London, the subjects of which and their treatment led to his being sought out by Mr. A. J. Downing, at whose invitation he soon afterward came to and established himself as an architect in America. He here became not only the intimate friend but the professional partner of Mr. Downing, a man who more than any other in my knowledge possessed the attributes of genius both in the art of landscape-gardening, and in that of conveying to others an understanding of the conditions of success in that art. It was through the exertions of Mr. Downing that the project of a park in New York first became popular; and when five years after his lamented death a plan for the Central Park was wanted, there was no man to whom it came more naturally, properly, and in due sequence of a strictly professional career, to undertake to provide it, than to the architect who had been his chosen disciple, and enjoyed the privilege of aiding him in his latest and best work.

In due time with the co-operation of an associate whom he had selected, invited, and with some difficulty persuaded to join him, a study was produced, which being submitted in competition was adjudged the best of thirty-three which had been offered in conformity with the rules prescribed, all but two or three of the remainder being the work exclusively of men untrained in architecture. The design was adopted, and though many details have been introduced in an outlay since made of over eight millions of dollars, it has been substantially adhered to. After nearly twenty years of growth following labor, and labor waiting on growth, the intended landscape effects are beginning to be disclosed. They are found worthy of praise in an architectural record; but all the circumstances above indicated, by which they are more directly related to the interests of architecture as a professional pursuit, are forgotten.

There is a popular impression about architects, on account of which, if there were no other reasons, it is proper they should be recalled. I mean the impression that the special training of an architect, and his habit of dealing almost exclusively with rigid materials, disqualifies him for co-operating intimately, cordially, and successfully, in works of landscape design.

For the same reason, testifying now as the associate of Mr. Vaux in the design of the Central Park, I personally owe it to his profession to say that in his discussion even of such matters as the shaping of embankments, the disposition of rocks, the outlining shores and of plantations, and in determining the exact adjustment to natural conditions of roads and walks, with the purpose of bringing means of convenience relatively large into tolerable subordination to means of developing picturesqueness through objects necessarily restricted in breadth and in detail, methods of study acquired in the training of the architect proved not only no obstacle to satisfactory results, but manifestly a great furtherance.

You will see by the accompanying copy of the London *Garden* that I have before now been led by the conviction thus expressed, in addressing those who stand for the other side of the question, to urge that architects should always be associated in the general design of important landscape undertakings; and in the public works in which I have been engaged since my partnership with Mr. Vaux expired, I have secured such co-operation.

And I may properly add that a gentleman who has had a wider range of practice, and been connected with more important works in landscape than any other in Europe, has, since this publication in the *Garden*, privately advised me that his own experience has led him to place a similar estimate in this respect on the value of architectural training as an auxiliary element in landscape design.

There is a second question as to which I will, if you please, at another time state facts which have equally been forgotten with those mentioned in this letter. What I have now said must make it sufficiently clear that in an architectural minute as to the design of the Central Park, if but one man's name is to be mentioned, it is courtesy overmuch to make it that of your obedient servant,

FREDERICK LAW OLMSTED.

TRAPS.

NEW YORK, May 13, 1877.

TO THE EDITOR OF THE AMERICAN ARCHITECT AND BUILDING NEWS.

Dear Sir, — In your issue of April 28, Mr. Normand S. Patton of Chicago calls attention to my statement that in draining houses "I take the precaution to use traps which cannot lose their seals from any cause except evaporation," and asks whether there are such traps, and where they can be obtained.

In reply to this inquiry I would say that any of the traps in common use will hold their seals if properly vented. Mr. Patton says, —

> "It is well known that the traps almost universally used in plumbing, viz., tubes bent in the form of an ∪, are very liable to lose their seals by being 'siphoned out.' Ventilation of the waste pipe will not prevent this; and the only remedy seems to be the adoption of an improved form of trap. Although attention has frequently been called to this imperfection in water-traps, I have yet to learn of any movement among architects or plumbers to secure any improvement. What is wanted is a trap through which air may be forced without driving out the water sufficiently to unseal it. Such a trap can be easily constructed. Are there any in the market?"

The venting of the soil-pipe will guard the water-seal of an ∪ trap against ordinary accident, but does not afford absolute secur-

ity. This can be attained by venting the traps independently of the soil-pipe by carrying an air-pipe from the top of the bend, as shown in the drawing marked Fig. 1. These air-pipes may be carried into the soil-pipe above all branch wastes, or run into a single

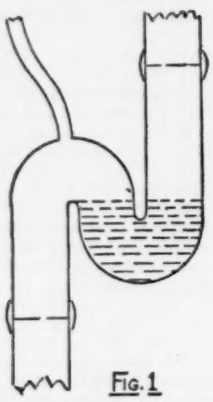


FIG. 1

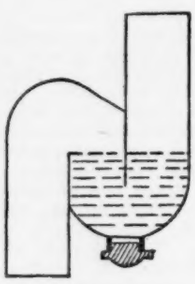


FIG. 2

pipe and extend through the roof separately. The admission of air at the crown of the bend below the seal renders siphoning impossible, and insures a seal the full depth of the dip. This may be lost by evaporation, or drawn off by a thread or string or bit of rag lodged in the trap and hanging over the bend; but such accidents are not likely to occur, and are of necessity common to all traps sealed with water.

Of traps which will hold their seals without separate venting, there are a great number in use. The best form of trap which has come to my notice is that shown in the drawing marked Fig. 2. This trap, in several forms, was invented by Mr. John Foley, an intelligent practical plumber of Brooklyn, and has been very successfully and generally introduced by Messrs. F. Adee & Co., of New York. I can say from my own knowledge, gained from careful experimental tests, that it is impossible to unseal this trap by driving air or water through it, and that it meets all the conditions which Mr. Patton states to be essential in a perfectly satisfactory trap. The area of water surface in the body of the trap being two and a half times as great as the area of the pipe, enables it to retain a half-inch seal even when air is blown through it with considerable force. The peculiar shape of this trap gives it other advantages which need not be noted here.

Respectfully, JAS. C. BAYLES.

NOTES AND CLIPPINGS.

DEDICATION OF A GERMAN CATHOLIC CHURCH. — The new Church of the Holy Trinity, built by German Catholics and situated on Shawmut Avenue, Boston, was dedicated May 27, Trinity Sunday. The church was built from the plans of P. C. Keeley of Brooklyn, N.Y., who was also the architect of the Boston Cathedral. It is a hundred and fifty feet in length, seventy-four feet in width, and from the floor to the apex of the central arch the distance is fifty-eight feet. It consists of a nave and two aisles, each of which terminates with an altar, that of the nave being placed in an apsidal recess. It is in effect three churches under one roof, for the pillars that support the clere-story are so arranged that, while standing either in the nave or in either of the aisles, the altar at its end is the principal object in view. On the north side of the nave is the pulpit, which is elevated about four feet from the floor. It is built of black walnut and light woods, and is surmounted by a sounding-board. On the edge of this board are the emblems of the four evangelists. The building has a seating capacity of 1,100, and it is fitted with pews of chestnut trimmed with black walnut. The chancel-rail is of black walnut. In the centre of the chancel is the high altar, which is dedicated to the Holy Trinity. Although built of wood, it has the appearance of being of marble. Like every thing else in the church, it is a Gothic structure. At the head of the north aisle is the altar of the Blessed Virgin, and terminating the other aisle is the altar of St. Joseph. The most beautiful features of the structure are the stained-glass windows, which are gifts. The cost of the church was about $200,000.

AN UNUSUAL CHURCH PLAN. — The new edifice for the Baptist Church on Pierrepont Street, Brooklyn, is now in course of erection from plans by L. B. Volk, and will present several noteworthy peculiarities. The building measures 100 x 113 feet, in which will be the auditorium, of amphitheatrical shape, without columns. The two striking features are the elliptical form of the auditorium, which has a length of 92 feet, the largest diameter extending well into two opposite corners, and the gallery which slopes down to the main floor from all sides. Encircling the auditorium, beneath the gallery, is a broad corridor connecting the three entrances, which are placed at corners of the building opening directly upon the sidewalk, the fourth corner being occupied by the pulpit and space for the choir. Mr. Volk promises one of the finest auditoriums in the country: it will have a lofty ceiling forty feet in height. The edifice will be completed next January, at a cost not exceeding $50,000.

DANVERS BRICKS. — Eleven millions of bricks are made annually in Danvers, Mass.

THE CINCINNATI CUSTOM HOUSE. — A large number of workmen have been discharged from the United States Custom House, and it is feared that the construction of the building will be partially suspended for some time, owing to the failure of the contractors to deliver the granite. The cutting of granite at the quarries has also stopped until after the Secretary's decision on the report of the commission recently appointed to ascertain the terms upon which work may be resumed under the fifteen per cent contracts or modifications thereof.

THE EXISTING GOVERNMENT CONTRACTS. — The commission to consider the contracts for the completion of public buildings held a meeting May 28. Almost all the contractors for supplying stone have manifested their willingness to consent to the abrogation of the 15 percentum contracts and enter into new ones at lower rates. The contractors propose to reduce the wages of the stone-cutters, which they say are too high. The commission expect to make new contracts so as to save the Government 25 per centum on the prices now paid.

A LONG TUNNEL. — Baltimore is constructing the longest tunnel in the country. When completed it will be seven miles long, circular in shape, and twelve feet in diameter. Five miles of the distance is through very hard rock, and the drilling is done by manual labor, powder-drills being impracticable in such a small space. The rest of the wall will be bricked. Fifteen shafts have been sunk. The cost is estimated at $3,000,000; about 1,500 men are employed, and the tunnel will probably be completed in three years. The object of the tunnel is to supply the city with water, the present supply having proven inadequate and of wretched quality.

THE FIRES IN 1876. — There were in the United States, during the year 1876, 9,301 fires, destroying property to the aggregate value of $73,775,000 — of which $38,262,000 was covered by insurance. The total loss was $12,552,000 less than in 1875, and the insurance $5,369,000 less. The losses for 1876 were about one-half of one per cent of the assessed valuation of all the taxable property in the country.

ILLINOIS MOUNDS. — At a late meeting of the Philadelphia Academy of Sciences, Mr. John Ford described a group of eight burial-mounds opened by him near Coup's Creek, Macoupin County, Ill. Each of the graves was lined with stone slabs, and after the bodies were placed in position within, earth had been packed around them so as to fill the enclosure. All the skeletons found in these graves faced the east. In one of the graves four skeletons were found, seated in two pairs, the knees of one pair pressing against the backs of the other. The arms were crossed. In the right hand of each individual thus interred, a large marine shell (*Buccinum perversum*, Linn.) had been so placed that the small end of the shell rested in the hand and the large end in the hollow above the left hip. Within each shell what appeared to be the bones of a child were found, whose skull had been crushed before burial, the skull protruding beyond the aperture of the shell. It is thought that these infants were sacrificed to the dead. In most of the graves the left side of the skulls of the adults appeared also to have been crushed by some blunt weapon.

A TECHNICAL UNIVERSITY IN LONDON. — About $50,000 have been conditionally subscribed towards founding a technical university in London, under the auspices of the livery companies, among whom are found the Mercers', Drapers', Fishmongers', Goldsmiths', Clothworkers', Armorers' and Braziers', and Plasterers' companies.

THE ELGIN MARBLES. — Several new fragments belonging to the Elgin sculptures in the British Museum have lately been discovered in excavations made on the south side of the Acropolis at Athens. The identification has been made by means of plaster casts forwarded to the Museum.

WATER-GLASS. — The suggestion of Baron Von Liebig, touching the production of water-glass from infusorial earth, was not brought into practical use, owing to the fact it was until recently impossible to obtain calcined earth. Since Messrs. Grune and Hagemann, of Unterluss, near Erschede, have succeeded in calcining and bringing the infusorial earth at small cost into the market, Capitaine has taken up this long since suggested method. He places caustic soda of a specific gravity averaging from 1.22 to 1.24 in a digester supplied with a stirring apparatus, and adds thereto such a quantity of calcined infusorial earth that to every part of iodic hydrate 2.8 earth are present. Steam at a pressure of three atmospheres is admitted, and a perfect solution results in a few hours. The end of the operation is recognized by the clearing of the caustic solution and the deposition of a dark brick-red precipitate. A surplus of earth must be avoided, as the solution will not clear on these conditions. It is also to be observed that the solution should not obtain a greater specific gravity than 1.18. If caustic soda of 1.30 specific gravity be taken, the resulting water-glass will have a specific gravity from 1.22 to 1.25, and will clear in less than a week. It is advisable to dilute to a specific gravity of 1.18. On account of the condensation of the steam, the water-glass is always of smaller specific gravity than the caustic soda. Capitaine is of the opinion that water-glass prepared by the wet way can compete commercially with the glass made by any other method in all such localities where the cost of transporting the infusorial earth does not exceed 15 or 20 per cent of the original cost.

THE BOSTON BASILICA. — The *Architect* states that Trinity Church is called the "Boston Basilica." Why it should be so called, we are unable to guess.

A CURIOUS ASSOCIATION. — The Registrar General of Great Britain classes saddlers, shipbuilders, architects, surveyors, builders, carpenters, and joiners together, and says that of this class there are in London thirty-two thousand.